

## CLAIMS

### What Is Claimed Is:

1. A recoil starter comprising:

a starter casing including a reel shaft disposed coaxially with a crankshaft of an engine, which crankshaft has a drive pulley mounted thereon;

a rope reel rotatably supported on said reel shaft and provided at an outer periphery thereof with a drum portion around which a recoil rope is wound;

a recoil spring for rotationally urging said rope reel in a direction in which said recoil rope is rewound;

a ratchet member disposed on a side surface of said rope reel, said ratchet member being adapted to engage with said drive pulley so that a rotation of said rope reel is transmitted to said drive pulley; and

a control member that is rotatably attached to said reel shaft while a rotational resistance is imparted thereto so that said control member disengageably abuts against said ratchet member;

wherein when said rope reel is rotated in an engine starting direction by pulling said recoil rope, said ratchet member is pivotally turned so as to engage with said control member and project radially outwardly, whereby said ratchet member engages with said drive pulley to allow said drive pulley to rotate integrally with said rope reel, to thereby start the engine;

wherein said ratchet member is formed of a material having a circular shape in section by bending said material; and

said ratchet member is pivotally supported on said side surface of said rope reel.

2. The recoil starter according to claim 1, wherein said drive pulley is formed to have a cylindrical shape and has an opening formed in an end portion thereof;

said ratchet member includes an arm and a pivot portion formed at one end of said arm in a manner to be bent at a right angle;

said rope reel is formed therein with a support hole for rotatably supporting said pivot portion of said ratchet member and is provided with a receiving section for restricting a pivotal movement of said ratchet member by being abutted against a

distal end portion of said arm of said ratchet member when said ratchet member is located at a position where said ratchet member radially outwardly projects, so that said ratchet member is pivotally turned about said support hole so as to permit said arm of said ratchet member to be held at said distal end portion thereof on said receiving section of said rope reel while said arm passes through said opening of said drive pulley.

3. The recoil starter according to claim 2, wherein said arm of said ratchet member is formed to have a dogleg shape by being bent at a center thereof in a plane perpendicular to said pivot portion of said ratchet member.

4. The recoil starter according to claim 2, wherein said arm of said ratchet member is provided with an end face which is formed to be inclined by cutting so as to prevent said end face from engaging with an edge of said opening of said drive pulley.

5. The recoil starter according to claim 3, wherein said arm of said ratchet member is provided with an end face which is formed to be inclined by cutting so as to prevent said end face from engaging with an edge of said opening of said drive pulley.

6. The recoil starter according to claim 2, wherein said arm of said ratchet member is provided on a side surface thereof with a flat surface which is engageable with the edge of said opening of said drive pulley.

7. The recoil starter according to claim 3, wherein said arm of said ratchet member is provided on a side surface thereof with a flat surface which is engageable with the edge of said opening of said drive pulley.

8. The recoil starter according to claim 4, wherein said arm of said ratchet member is provided on a side surface thereof with a flat surface which is engageable with the edge of said opening of said drive pulley.

9. The recoil starter according to claim 2, wherein said control member is provided with an engaging edge that is adapted to abut against said ratchet member, said control member being rotatably attached to said reel shaft while the rotational resistance is imparted to said control member by a spring;

said ratchet member is urged by an additional spring in a direction in which said arm of said ratchet is pivotally turned so as to move radially inwardly;

when said rope reel is rotated in the engine starting direction, said engaging edge abuts against said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to radially outwardly project; and

when said rope reel is rotated in the opposite direction by said recoil spring, said engaging edge is disengaged from said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to move radially inwardly.

10. The recoil starter according to claim 3, wherein said control member is provided with an engaging edge that is adapted to abut against said ratchet member, said control member being rotatably attached to said reel shaft while the rotational resistance is imparted to said control member by a spring;

said ratchet member is urged by an additional spring in a direction in which said arm of said ratchet is pivotally turned so as to move radially inwardly;

when said rope reel is rotated in the engine starting direction, said engaging edge abuts against said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to radially outwardly project; and

when said rope reel is rotated in the opposite direction by said recoil spring, said engaging edge is disengaged from said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to move radially inwardly.

11. The recoil starter according to claim 4, wherein said control member is provided with an engaging edge that is adapted to abut against said ratchet member, said control member being rotatably attached to said reel shaft while the rotational resistance is imparted to said control member by a spring;

said ratchet member is urged by an additional spring in a direction in which said arm of said ratchet is pivotally turned so as to move radially inwardly;

when said rope reel is rotated in the engine starting direction, said engaging edge abuts against said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to radially outwardly project; and

when said rope reel is rotated in the opposite direction by said recoil spring, said engaging edge is disengaged from said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to move radially inwardly.

12. The recoil starter according to claim 6, wherein said control member is provided with an engaging edge that is adapted to abut against said ratchet member, said control member being rotatably attached to said reel shaft while the rotational resistance is imparted to said control member by a spring;

said ratchet member is urged by an additional spring in a direction in which said arm of said ratchet is pivotally turned so as to move radially inwardly;

when said rope reel is rotated in the engine starting direction, said engaging edge abuts against said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to radially outwardly project; and

when said rope reel is rotated in the opposite direction by said recoil spring, said engaging edge is disengaged from said ratchet member, whereby said arm of said ratchet member is pivotally turned so as to move radially inwardly.

13. The recoil starter according to claim 1, wherein said starter casing is provided on a side surface thereof with an air inlet for introducing air for cooling the engine; and

said rope reel includes a boss portion formed at a center thereof, said rope reel having an air passage which is formed between said drum portion and said boss portion thereof in such a manner to face said air inlet of said starter casing.

14. The recoil starter according to claim 2, wherein said starter casing is provided on a side surface thereof with an air inlet for introducing air for cooling the engine; and

said rope reel includes a boss portion formed at a center thereof, said rope reel having an air passage which is formed between said drum portion and said boss portion thereof in such a manner to face said air inlet of said starter casing.

15. The recoil starter according to claim 3, wherein said starter casing is provided on a side surface thereof with an air inlet for introducing air for cooling the engine; and

said rope reel includes a boss portion formed at a center thereof, said rope reel having an air passage which is formed between said drum portion and said boss portion thereof in such a manner to face said air inlet of said starter casing.

16. The recoil starter according to claim 4, wherein said starter casing is provided on a side surface thereof with an air inlet for introducing air for cooling the engine; and

said rope reel includes a boss portion formed at a center thereof, said rope reel having an air passage which is formed between said drum portion and said boss portion thereof in such a manner to face said air inlet of said starter casing.

17. The recoil starter according to claim 6, wherein said starter casing is provided on a side surface thereof with an air inlet for introducing air for cooling the engine; and

said rope reel includes a boss portion formed at a center thereof, said rope reel having an air passage which is formed between said drum portion and said boss portion thereof in such a manner to face said air inlet of said starter casing.

18. The recoil starter according to claim 9, wherein said starter casing is provided on a side surface thereof with an air inlet for introducing air for cooling the engine; and

said rope reel includes a boss portion formed at a center thereof, said rope reel having an air passage which is formed between said drum portion and said boss portion thereof in such a manner to face said air inlet of said starter casing.